

REMARKS

Claims 1-12 and 15-43 are pending in this application. No amendment to the claims is made in this Response.

Claims 1-12 and 15-43 are rejected under 35 U.S.C. 112, first paragraph (Office action point 4).

The Examiner indicates that there is no support for the amendment: "carbon fibers having an average fiber diameter of not less than 0.5 μm ~~to~~ but less than 5 μm ".

Reconsideration of the rejection is respectfully requested. In addition to Applicants' comments regarding this amendment in the Amendment of January 4, 2002, Applicants further note that written disclosure support for this amendment is inherently provided by the claims before amendment, since the amendment reflects only a narrowing in the upper limit of the previously recited range. MPEP 2163.05 (III) states:

III. RANGE LIMITATIONS

With respect to changing numerical range limitations, the analysis must take into account which ranges one skilled in the art would consider inherently supported by the discussion in the original disclosure. In the decision in *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976), the ranges described in the original specification included a range of "25%-60%" and specific examples of "36%" and "50%." A corresponding new claim limitation to "at least 35%" did not meet the description requirement because the phrase "at least" had no upper limit and caused the claim to read literally on embodiments outside the "25% to 60%" range, however a limitation to "between 35% and 60%" did meet the description requirement.

That is, a claimed range narrower than a disclosed range is supported.

In addition, Applicants note that the specification on page 20, line 24, discloses "carbon fibers having an average diameter of approximately $2\text{ }\mu\text{m}$ or smaller ...". This further provides support for the specific recitation of "less than $2\text{ }\mu\text{m}$ " as the upper limit of the range.

Claims 10 and 42 are rejected under 35 U.S.C. 112, second paragraph, as indefinite (Office action point 6).

The Examiner indicates that the limitation regarding "b" is unclear. The Examiner states that if "b" were 3.99, the bulk density would be negative.

Reconsideration of the rejection is respectfully requested.

Applicants note that claim 10 clearly recites that "b is an arbitrary number fixed so that the bulk density is positive" Therefore, the claim **cannot** recite a negative bulk density. In the manufacturing process, the arbitrary number "b", which is limited to a value between 0.3 and 4, is a ratio of the amount of thermosetting resin to the amount of carbon fiber aggregate. The value of "b" is determined by the amount of thermosetting resin added.

The Examiner questions the hypothetical case where "b" is 3.99. As noted, the bulk density in the third step of claim 10 is recited to be between (3-b) and (10-b), but must also be positive. Therefore, if b is greater than 3, the density is limited to be a positive value, that is, a value between 0 and (10-b). The density value of $(3-3.99) = -0.99$ is not permitted by the claim.

Claims 1-9, 11-41 and 43 are rejected under 35 U.S.C. 103(a) as unpatentable over McCullough, Jr. et al. in view of Otani et al. (U.S. Pat. No. 4,504,455) (Office action point 7).

Reconsideration of the rejection is respectfully requested. Applicants note that of the claims rejected here, only 1-9, 11, 12, 15-41 and 43 are pending.

Applicants respectfully submit that neither of the cited references provides any teaching, suggestion or motivation for the limitation of the present claims that the carbon fibers have "an average diameter of not less than 0.5 μm but less than 2 μm ".

Applicants have noted previously that McCullough, Jr. discloses carbon fibers having a fiber diameter of 2 to 25 microns (column 4, lines 26-27), and there is no overlap between that range and the range of "not less than 0.5 μm but less than 2 μm " in the present claims. McCullough, Jr.'s statement that the more preferable range is 4 to 12 microns also supports there being no suggestion in McCullough, Jr. to use fibers shorter than 0.5 microns. This limitation alone completely distinguishes all of the present claims from McCullough, Jr.

Likewise, Otani et al. does not teach, suggest or motivate one to use a carbon fiber with an average diameter being not less than 0.5 μm to less than 2 μm . In fact, Otani et al. does not appear to discuss fiber diameter in detail. Otani et al. does disclose in Example 1 that the extruder for spinning fibers had an orifice diameter of 0.3 mm (300 μm) and that the length/diameter ratio was 3 (column 7, lines 54-55). This suggests use of fibers that are approximately 300 μm , and there appears to be no suggestion that fibers might be less than 2 μm . In addition, this suggests fibers of length 900 μm , also inconsistent with the recitation of claim 1.

Given that neither reference teaches, suggests or motivates the average fiber diameter of the present claims, no *prima facie* case of obviousness can be made for the claims, and Applicants believe that claims 1-9, 11, 12, 15-41 and 43 are novel and non-obvious over McCullough, Jr. et al. and Otani et al. (U.S. Pat. No. 4,504,455), taken separately or in combination.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned Agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully Submitted,

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